

5-Year Program Review

**Computer and Information Sciences
Department**

March 2005

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Proposed Actions

Course changes

Delete the following courses:

- CSCI 130 Introduction to Programming
- CSCI 150 Internet Programming and Applications
- CSCI 205 Advanced Microcomputer Applications in Business
- CSCI 220 Programming with COBOL
- CSCI 240 Assembler Language Programming
- CSCI 385 Programming in Java
- CSCI 440 Multimedia Development
- CSCI 610 Advanced Programming Languages
- CSCI 700 Software Engineering
- CSCI 750 Enterprise Resource Planning

The need for the above as stand-alone courses no longer exists. The important content from 130, 150, 205, and 240 has been moved into other courses. CSCI 220 is not needed since the introductory programming sequence has been entirely reorganized and students will take other programming courses as prerequisites for the remaining COBOL course. CSCI 385 is redundant since the introductory programming sequence of CSCI 195-295 will now be taught using Java as the instructional programming language. CSCI 440 has not been taught for 3 years and the focus of the CIS department and its programs makes this course an inappropriate addition to the CIS offerings. Multimedia development is more appropriate as part of a Graphics Design program.

Both CSCI 610 and 700 are fine courses, but both are computer science theory courses and are not appropriate to a degree in Information Technology Management. CSCI 750 was too narrowly focused and covered only one aspect of enterprise IT management.

Add the following courses:

- CSCI 180 Discrete Structures
- CSCI 185 Script Programming
- CSCI 375 Network Forensics
- CSCI 393 Algorithm Design and Analysis
- CSCI 630 Information Assurance
- CSCI 740 Management of Information Technology
- CSCI 775 Professional Internship (0-1 credits) */*approved at 1 credit*/*

The content of the proposed CSCI 180 and CSCI 393 courses had been included in the Computer Science (CS) curriculum in the past, but the courses were removed. Over the past five years there has been an attempt to include this content within other courses, but the result has not been satisfactory. Since the content is fundamental to a Computer Science degree we are proposing to bring these courses back. Other courses have had

content restructuring and still others have been removed from the CS major to make room for these.

The Computer Network Administration (CNA) degree has had a programming course as an elective since its inception. It was hoped that most CNA majors would select this option, but most have not. In order to provide the appropriate type of programming for CNA majors, the CSCI 185 course is proposed. This course will provide the programming background needed by a system's administrator to automate routine administrative tasks and perform more complex operational analysis in a server environment.

The Criminal Justice and Computer Security (CJCS) major had a requirement for an independent study project or a special topics. A special topics in Intrusion Detection has been taught for three years to fulfill this requirement. The CSCI 375 course is the Intrusion Detection course and has become fundamental to a complete computer investigations degree program.

The MS in Information Technology Management program (MSITM) is being fine-tuned, with inappropriate courses being removed and more appropriate courses being added to replace them. The CSCI 740 course is a replacement for CSCI 750, which is being dropped. CSCI 740 covers the IT management function from a broader perspective and will fill in some gaps that existed in the MSITM curriculum. The CSCI 630 course is in response to both changes in the IT field, and student interest in issues of information security. This course will complement the more technical CSCI 515 by dealing with management, auditing, and compliance issues related to a corporate security function.

Some of our MSITM students are pursuing a career change and do not have much experience in the IT field. In addition, in order to attract international students, there is a need for an opportunity for off-campus work experiences. The CSCI 775 course is proposed to fill both of these needs. The professional work experience can be repeated for credit or for no credit. However, it cannot be used to replace a full elective and so it is being restricted to a maximum of 2 credits total. */*Approved at 1 credit may be repeated as needed but may not be used to replace a core course or an elective.*/**

Change the following courses:

Rename

CSCI 195 C++ Programming
To: Object-Oriented Programming I

CSCI 390 Advanced COBOL Programming
To: Application Programming in COBOL

CSCI 790 Thesis Research
To: CSCI 790 Research

Renumber

CSCI 370 Networks and Data Communication
To: CSCI 270 Networks and Data Communication

Renumber and Rename

CSCI 395 C++ Programming II
To: CSCI 295 Object-Oriented Programming II

In order to reflect changes in the software industry and trends in the teaching of software development, the instructional language for the introductory programming sequence is being modified to Java. This requires a name change since C++ is no longer being used in the sequence. In addition, the CSCI 395 number for the second course does not reflect our desire for students to take the two courses as a contiguous sequence. Changing CSCI 395 to CSCI 295 will help reinforce the department's desire for students to take the course in a contiguous manner.

The change in title of the COBOL course is necessitated by the dropping of the introductory COBOL course. It is not appropriate to have an "Advanced" course if there is no introductory course.

When CSCI 370 was first added to the curriculum, it was an advanced topic in computer science. With the proliferation and pervasiveness of networks today, this course has become fundamental introductory knowledge for a student in any IT field. The change in course number from CSCI 370 to CSCI 270 will reflect both the content of the course and its placement within the CIS department's major programs.

While most MSITM students do not do a thesis, we still would like graduate students to have an opportunity to pursue an independent research project. Changing the name from Thesis Research to Research allows the CIS department to use this course for any MSITM student wishing to pursue a research project even if it is not part of a thesis.

Program Changes

The program changes are organized as follows. Each of our five programs will be presented in a separate section and will be presented first in its current form and labeled as current. Immediately following that will be the proposed program appropriately labeled, followed by an enumeration of the changes and rationale for the changes.

The programs are presented in the following order: Computer Science (CS), Computer Information Systems (CIS), Computer Network Administration (CNA), Criminal Justice and Computer Security (CJCS), and Master of Science in Information Technology Management (MSITM).

Bachelor of Science in Computer Science (Current)

Complete all of the following (31 credits):
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CSCI 195	C++ Programming I
CSCI 240	Assembly Language Programming
CSCI 310	Data Structures
CSCI 320	Computer Architecture
CSCI 360	Database Management Systems
CSCI 370	Networks and Data Communications
CSCI 395	C++ Programming II
CSCI 400	Programming Language Concepts
CSCI 410	Operating Systems
MATH 191	Calculus and Analytic Geometry I

Complete two of the following (6 credits):

CSCI 385	Java Programming
CSCI 430	Artificial Intelligence
CSCI 440	Multimedia Development

Complete one of the following (3 credits):

CSCI 420	TCP/IP and Internet Management
CSCI 450	Network Operating Systems
CSCI 470	Advanced Computer Networks and Data Communication

Complete one of the following (3 credits):

CSCI 480	Special Topics
MATH 192	Calculus II
MATH 290	Elementary Linear Algebra
MATH 300	Probability and Statistics I

Program total: 43 credits required

Bachelor of Science in Computer Science (Proposed)

Complete all of the following (40 credits):
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CSCI 180	Discrete Structures
CSCI 195	Object-Oriented Programming I
CSCI 270	Networks and Data Communications
CSCI 295	Object-Oriented Programming II
CSCI 310	Data Structures
CSCI 320	Computer Architecture
CSCI 360	Database Management Systems
CSCI 393	Algorithm Design and Analysis
CSCI 400	Programming Language Concepts
CSCI 410	Operating Systems
CSCI 435	Legal and Ethical Issues in Computing
MATH 191	Calculus and Analytic Geometry I

Complete two of the following (6 credits):

CSCI 430	Artificial Intelligence
CSCI 480	Special Topics
CSCI 490	Senior Project

Complete one of the following (3 credits):

CSCI 420	TCP/IP and Internet Management
CSCI 450	Network Operating Systems
CSCI 470	Advanced Computer Networks and Data Communication

Complete one of the following (3 credits):

MATH 290	Elementary Linear Algebra
MATH 300	Probability and Statistics I

Program total: 49 credits required

Bachelor of Science in Computer Science (Summary and Rationale)

Add CSCI 180 Discrete Structures, CSCI 393 Algorithm Design and Analysis, and CSCI 435 Legal and Ethical Issues in Computing as required courses.

Remove CSCI 240 Assembler Language Programming as a required course.

Remove CSCI 385 Programming in Java and CSCI 440 Multimedia Development from the advanced computer science electives.

Add CSCI 490 Senior Project and CSCI 480 Special Topics in Computer Science to the advanced computer science electives.

Remove MATH 192 Calculus and Analytic Geometry II from the math electives.

Required hours increases from 43 to 49.

A review student work (computer programs, written assignments, and exams) at the junior and senior level revealed a lack of sufficient problem solving skills and a lack of mastery of some fundamental computer science concepts. Several attempts were made by the CIS department to remedy this. A "Programming Readiness Test" was developed to assess the problem solving skills possessed by students entering the Computer Science major. The prerequisites for various courses were reviewed. The content of virtually all courses required for a major in Computer Science were reviewed. Some courses were redesigned. While these were positive changes, a corresponding improvement in the problem solving skills of upper division students did not follow. A review of the 2001 Computing Curricula for Computer Science, produced jointly by the ACM and IEEE, was therefore undertaken. This review revealed several gaps in our Computer Science curriculum. In order to fill these gaps CSCI 180 and CSCI 393 are being added as required courses.

The addition of CSCI 435 as a required course addresses the world-wide need for a conscious evaluation of ethical and legal considerations of the tremendous involvement that technology plays in our lives today and in the future.

A review of CSCI 240 and CSCI 320 (Computer Architecture) revealed a significant overlap in content. These two courses have been consolidated in to the single course CSCI 320.

While the coursework required for Computer Science majors emphasizes the connections among different courses, it is essential for students to actively integrate this array of topics. CSCI 490 provides a vehicle for doing this.

The Java programming language is rapidly becoming a de facto standard programming language for industry and academia. Therefore, the introductory programming two course sequence (CSCI 195 and CSCI 295) are being changed to utilize the Java programming

language in lieu of the currently used C++ programming language. This change obviates the need for a separate Java programming course. CSCI 385 is therefore no longer being offered.

The topics addressed in MATH 192 are not widely used to model Computer Science problems. In contrast, the mathematical techniques addressed in MATH 290 and MATH 300 are commonly used to model computer representation of problems and to analyze the efficiency and correctness of such models. MATH 192 is therefore being removed as a math elective while MATH 290 and MATH 300 are being retained.

Computer Information Systems (Current)

Computer Science Core Component (27 credits) :

CSCI 195	C++ Programming I
CSCI 205	Advanced Micro-computer Applications for Business
CSIC 210	Computer Systems
CSCI 220	COBOL Programming
CSCI 275	Visual Basic
CSCI 370	Networks and Data Communications
CSCI 300	Systems Analysis and Design
CSCI 360	Database Management Systems

Select one of:

CSCI 395	C++ Programming II
CSCI 390	Advanced COBOL Programming

Select one of:

CSCI 440	Multimedia Development
CSCI 450	Network OS Topics
CSCI 460	Advanced Database
CSCI 470	Advanced Computer Networks and Data Communication
CSCI 480	Special Topics

Math / Statistics Component (3 credits):

STBE 337	Statistics for Business and Economics
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Communication Component (3 credits): Select one of

ENGL 315	Written Business Communication
COMM 326	Communication and Technology
COMM 327	Organizational Communication

Business Component (21 Credits): Take the following or an approved COB minor

ACCT 201	Accounting Principles I
ACCT 202	Accounting Principles II
ECON 201	Principle of Macroeconomics
ECON 202	Principle of Microeconomics
FNCE 300	Principles of Finance
MKTG 309	Principles of Marketing
MGMT 310	Principles of Management

Approved COB Minors: Accounting (18 credits), Economics (21 additional credits), Finance (30 additional credits), Marketing (15 credits), and Management (12 credits).

Program total: 63 credits required

Computer Information Systems (Proposed)

Computer Science Core Component (27 credits) :

CSCI 195	Object Oriented Programming I
CSIC 210	Computer Systems
CSCI 270	Networks and Data Communications
CSCI 275	Visual Basic
CSCI 295	Object Oriented Programming II
CSCI 390	Application Programming with COBOL
CSCI 300	Systems Analysis and Design
CSCI 360	Database Management Systems
CSCI 435	Legal and Ethical Issues in Computing

Computer Science Electives (3 Credits):

A CSCI 300 level course or above

Math / Statistics Component (9 credits):

Math 151	College Algebra
STBE 337	Statistics for Business and Economics
STBE 333	Operation Management

Communication Component (3 credits): Select one of

ENGL 315	Written Business Communication
COMM 326	Communication and Technology
COMM 327	Organizational Communication

Business Component (21 Credits): Take the following or an approved COB minor

ACCT 201	Accounting Principles I
ACCT 202	Accounting Principles II
ECON 201	Principle of Macroeconomics
ECON 202	Principle of Microeconomics
FNCE 300	Principles of Finance
MKTG 309	Principles of Marketing
MGMT 310	Principles of Management

Approved COB Minors: Accounting (18 credits), Economics (21 additional credits), Finance (30 additional credits), Marketing (15 credits), and Management (12 credits).

Program total: 63 credits required

Computer Information Systems (Summary and Rationale)

Computer Component requirements increased from 36 hours to 39 hours

CSCI195 – course title and content change

CSCI 210 – changed prerequisite requirements

Dropped CSCI 205 Advanced Microcomputer Applications

Dropped CSCI 220 Programming with COBOL as an introductory course.

CSCI 270 – Course number changed from CSCI 370

CSCI 295 – added as a requirement, course title and content change, and course number changed from CSCI 395

CSCI 390 - course title change and content change

CSCI 435 – added requirement

STBE 333 - added requirement

Business Component – requirements for prescribed courses reduced from 24 to 21 hours

Dropped the requirement for an additional 300+ level business course

ECON 101 dropped and replaced with ECON 201

ECON 202 added requirement since both ECON 201 and 202 are prerequisites for FNCE 300

After reviewing the CIS curriculum and anecdotal classroom evidence the proposed changes were deemed appropriate in order to bring the base knowledge expected of graduates into line with industry expectations.

The narrowness of topics covered in CSCI 205 Advanced Microcomputer Applications was not meeting the needs of students to have a broad understanding of the systems in place in contemporary organizations. Replacing CSCI 205 with STBE 333 Operations Management will provide the required content as well as developing the student's ability to use advanced computer applications in analyzing operations.

Although COBOL is still extensively used in legacy applications the Java programming language is expected to be used for the majority of new program development in many organizations. Consequently students are better served by requiring a two semester JAVA programming sequence rather than an option for two semesters of COBOL. The COBOL proficiency needed for entry level programming positions can be sufficiently covered in a one semester offering.

CSCI 435 Legal and Ethical Issues in Computing was added as a requirement as a result of CIS Department's decision to require all students graduating with a degree in a computer discipline to understand the legal and ethical issues they may face in the workplace. Additionally it is intended that CSCI 435 become the writing intensive component of all CIS curriculums.

The prerequisite requirement for CSCI 210 Computer Systems was removed. It currently has a requirement of CSCI 195 C++ Programming I which has no impact on student's ability to understand CSCI 210 content. Removing the prerequisite also gives students two entry points into the program CSCI 195 and CSCI 210 adding flexibility when advising.

The prerequisite for CSCI 300 System Analysis and Design was changed from CSCI 195 C++ Programming to CSCI 360 Database Management Systems. It was thought that the CSCI 195 designated as the prerequisite would assure a certain level of student maturity. CSCI 360 will accomplish this as well as provide more flexibility in course content since introductory Database Management concepts are included in many Systems Analysis and Design textbooks the content need not be repeated.

The listed Business Component courses were changed to be up-to-date with current COB course prerequisites.

The renumbering of courses is discussed elsewhere in this document

Computer Network Administration (Current)

Computer Component (18 credits):

CSCI 210 Computer Systems
CSCI 370 Networks and Data Communications
CSCI 470 Advanced Computer Networks

Complete nine semester hours from the following courses.

CSCI 195 C++ Programming I
CSCI 420 TCP/IP and Internet Management
CSCI 450 Network OS Topics (may be repeated with different topic)
CCNA 499 Internship

Communications Component (15 credits):

COMM 203 Interpersonal Communications
COMM 306 Group Decision Making
COMM 326 Communication and Technology
ENGL 315 Written Business Communications
ENGL 218 Technical Writing

Business Component (3 credits):

MGMT 310 Principles of Management

CNA Component (3 credits):

CCNA 400 Capstone Seminar

Program total: 39 credits required

Computer Network Administration (Proposed)

Computer Component (27 credit hours total)

Take all of the following courses.

CSCI 185	Script Programming
CSCI 210	Computer Systems
CSCI 270	Networks and Data Communications
CSCI 420	TCP/IP and Internet Management
CSCI 435	Legal and Ethical Issues of Computing
CSCI 470	Advanced Computer Networks and Data Communication
CNA 400	Capstone

Select two of the following courses.

CSCI 450	Network Operating System Topics (May be repeated with different topic.)
CSCI 415	Computer and Network Security

Communication Component (12 credit hours total)

Take the following course.

COMM 326	Communication and Technology
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Select three of the following courses.

COMM 203	Interpersonal Communication
COMM 306	Group Decision Making
COMM 327	Organizational Communication
ENGL 315	Written Business Communication
ENGL 218	Technical Writing

Business Component (3 credit hours)

MGMT 310	Principles of Management
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Program total: 42 credits required

Computer Network Administration (Summary and Rationale)

Add CSCI 185 Script Programming, CSCI 420 TCP/IP and Internet Management, and CSCI 435 Legal and Ethical Issues in Computer to the Computer Component.

Add CSCI 415 Computer and Network Security to the Computer Electives.

Change the communication component to still require COMM 326, but allow a selection of 3 courses from COMM 203, COMM 306, COMM 327, ENGL 315, and ENGL 218.

Required hours increases from 39 to 42.

Informal feedback from our CNA graduates and our Advisory board indicates that some experience with automating tasks through scripting is an essential component of a CNA curriculum. The Computer Network Administration (CNA) degree has had a programming course as an elective since its inception. It was hoped that most CNA majors would select this option, but most have not. In order to provide the appropriate type of programming for CNA majors, the CSCI 185 course is proposed. This course will provide the programming background needed by a system's administrator to automate routine administrative tasks and perform more complex operational analysis in a server environment.

Almost all businesses today have some connection to the internet. The protocol suite that drives the Internet is TCP/IP. In order to ensure that our graduates have a background with TCP/IP, the CSCI 420 class is moving from a selection to a required course.

The addition of CSCI 435 as a required course addresses the world-wide need for a conscious evaluation of ethical and legal considerations of the tremendous involvement that technology plays in our lives today and in the future.

The current CNA curriculum prescribes five specific courses that must be completed. Our departmental assessment of student writing proficiency shows a lack of specific skills for writing in a technical field. The addition of CSCI 435 (a writing intensive course) as a required course provides CNA students with an additional writing experience within the curriculum, one that will focus on writing skills appropriate in the IT field. This allows us to reduce the number of credits in the Communication Component from 15 to 12. Adding legitimate course choices provides each student the opportunity to create a communication component that matches their individual needs and goals.

Criminal Justice and Computer Security (Current)

Criminal Justice Courses (27 credit hours):
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CRJU 101	Introduction to Criminal Justice
CRJU 400	Criminological Theory
CRJU 102	Introduction to Law Enforcement
CRJU 411	The Constitution and Criminal Justice
CRJU 222	Criminal Law and Procedure
CRJU 421	Practicum (3 credits)
CRJU 407	Seminar in Criminal Justice
CRJU 342	Criminal Evidence and Investigation
CRJU 241	Crime Prevention Strategies

Computer/Network Security Courses (21 credit hours):

CSCI 210	Computer Systems
CSCI 370	Networks and Data Communications
CSCI 415	Computer and Network Security
CSCI 425	Computer Forensics (new course)
CSCI 420	TCP/IP and Internet Management
CSCI 435	Legal and Ethical Issues in Computing (Cross listed with CSCI 640)

Select one of the following courses:

CSCI 195	C++ Programming I
CSCI 450	Network Operating Systems Topics (Windows or Unix topic)
CSCI 480	Special Topics in CS (only if the topic is security related)

Computer Investigations and Criminal Justice (Proposed)

Computer and Network Security Courses (24 credit hours):

CSCI 210	Computer Systems
CSCI 270	Networks and Data Communications
CSCI 375	Network Forensics
CSCI 415	Computer and Network Security
CSCI 425	Computer Forensics
CSCI 420	TCP/IP and Internet Management
CSCI 435	Legal and Ethical Issues in Computing

Criminal Justice Courses (24 credit hours):

CRJU 101	Introduction to Criminal Justice
CRJU 102	Introduction to Law Enforcement
CRJU 221	Criminal Law and Procedure
CRJU 241	Crime Prevention Strategies
CRJU 342	Criminal Evidence and Investigation
CRJU 400	Criminological Theory
CRJU 407	Seminar in Criminal Justice
CRJU 411	The Constitution and Criminal Justice

Electives (6 credit hours): Select two of the following courses

CSCI 185	Script Programming
CSCI 450	Network Operating Systems Topics (Windows or Unix topic)
CSCI 480	Special Topics in CS (only if the topic is security related)
CSCI 490	Independent Study (only if the topic is security related)
CSCI 499	Internship (only if the placement is security related)
CRJU 421	Practicum (3 credits)

Program total: 54 credits required

Computer Investigations and Criminal Justice (Summary and Rationale)

Rename program to “Computer Investigations and Criminal Justice”.

Re-number CSCI 370 to 270.

Add CSCI 375 (new course) in place of a CSCI 480 Special Topics.

The program was recently moved from the Criminal Justice Department to the Computer and Information Sciences Department. The renaming of the major is in part to reflect the location of the program, but also to clarify the intent of the program. The program is not a computer security major, since security deals with management, compliance, policies, procedures, etc. This program is focused on investigations of events on, and using, computer-based systems.

The Criminal Justice and Computer Security (CJCS) major had a requirement for an independent study project or a special topics. A special topics in Intrusion Detection has been taught for three years to fulfill this requirement. The CSCI 375 course is the Intrusion Detection course and has become fundamental to a complete computer investigations degree program.

Master of Science in Information Technology Management (Current)

Computer Core: 15 credit hours required.

CSCI 560	Advanced Data Base Management Systems
CSCI 570	Advanced Computer Networks and Data Communications
CSCI 600	Systems Analysis in the Enterprise
CSCI 650	Project Management and Control
CSCI 640	Legal and Ethical Issues in Computing

Business Core: 9 credit hours required, up to 18 credit hours may be required if the MBA leveling courses are needed. MBA 505 and 506 are prerequisites for required courses. MBA 500 may be needed as a prerequisite for MBA 505 if the GMAT qualifying score is not met.

MBA 507	Managerial Accounting
MBA 621	Organizational Theory, Behavior and Communication
MBA 670	Operations Management

Electives: Complete 12 credit hours from the following. At least 9 credit hours must be selected from CSCI.

CSCI 515	Computer and Network Security
CSCI 610	Advanced Programming Languages
CSCI 660	Computers and Commerce
CSCI 700	Software Engineering
CSCI 750	Enterprise Resource Planning
CSCI 780	Advanced Topics in Information Systems
CSCI 790	Thesis Research (1-6 credits)
MBA 782	Decision Support Systems

Program total: 36-45 credits required

Master of Science in Information Technology Management (Proposed)

Computer Core: 15 credit hours required.

CSCI 560	Advanced Data Base Management Systems
CSCI 570	Advanced Computer Networks and Data Communications
CSCI 600	Systems Analysis in the Enterprise
CSCI 650	Project Management and Control
CSCI 640	Legal and Ethical Issues in Computing

Business Core: 9 credit hours required, up to 18 credit hours total may be required if the MBA leveling courses are needed. MBA 505 and 506 are prerequisites for required courses. MBA 500 may be needed as a prerequisite for MBA 505 if the GMAT qualifying score is not met.

MBA 507	Managerial Accounting
MBA 621	Organizational Theory, Behavior and Communication
MBA 670	Operations Management

Electives: Complete 12 credit hours from the following. At least 9 credit hours must be selected from CSCI.

CSCI 515	Computer and Network Security
CSCI 630	Information Assurance
CSCI 660	Computers and Commerce
CSCI 740	Management of Information Technology
CSCI 780	Advanced Topics in Information Systems
CSCI 790	Research (1-6 credits)
MBA 782	Decision Support Systems

Optional: Recommended for those seeking career change or for enhancement of experience base.

CSCI 775	Professional Internship (1 credit)
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Program total: 36 – 45 credits required

Master of Science in Information Technology Management (Summary and Rationale)

No changes are being made in requirements or the number of required hours. The only change is dropping three courses, adding three course, and renaming one course. The discussion from the course change section is repeated below.

The MS in Information Technology Management program (MSITM) is being fine-tuned, with inappropriate courses being removed and more appropriate courses being added to replace them. The CSCI 740 course is a replacement for CSCI 750, which is being dropped. CSCI 740 covers the IT management function from a broader perspective than CSCI 750 and will fill in some gaps that existed in the MSITM curriculum. The CSCI 630 course is in response to both changes in the IT field, and student interest in issues of information security. This course will complement the more technical CSCI 515 by dealing with management, auditing, and compliance issues related to a corporate security function.

Some of our MSITM students are pursuing a career change and do not have much experience in the IT field. In addition, in order to attract international students, there is a need for an opportunity for off-campus work experiences. The CSCI 775 course is proposed to fill both of these needs. The professional work experience can be repeated for credit or for no credit. */*Approved at 1 credit*/* However, it cannot be used to replace a full elective and so it is being restricted to a maximum of 2 credits total. */*No limit.*/**

Overall Description of the Department

The Department of Computer and Information Sciences (CIS) has the mission of providing its majors with the opportunity to develop a deep understanding of the core concepts in traditional computer science, information systems, or computer networks and to prepare them for progressive careers in the computer field or for continued study in graduate school.

Significant Departmental Changes and Events Since Last Program Review

1. The addition of the Master of Science in Information Technology (MSITM) program in fall 2001. The new program is offered in a regular semester evening format that shadows the evening MBA program. It is designed for working professionals, but welcomes full-time traditional graduate students.
2. In 2001 the CIS department received a three-year NSF grant totaling \$396,000 for tuition assistance for students in CIS department programs. The grant provided up to \$3,125 per year for each student who applied and met the qualifications. Student grant recipients participated in professional development seminars and had tutoring available through the grant funding. The grant expires this school year.
3. The CIS Department was moved from the College of Human Services to the College of Business in 2002.
4. Two new faculty were hired to fill general needs of the department and to fill needs brought about by the MSITM program. The department now has 6 full time faculty and an FTE of over 8 faculty (this number includes ACCEL).
5. A minor in Computer Security was added in 2003. While adding a minor is usually not a significant change, this minor moves the CIS department deeper into the area of computer security and that is a significant change.
6. The CNA major is being phased-out at ACCEL and the Computer Information Systems major is being phased-in. This does not affect the on-campus CNA program.
7. The Criminal Justice and Computer Security (CJCS) bachelor's program was moved from the Criminal Justice Department to the Computer and Information Sciences Department.

Outside Consultations

As part of the CNA program development, an advisory board was created with members from regional business and industry. The advisory board was involved with the initial specification and approval of the CNA program and had met twice a year to review the CNA program. When the Computer and Information Sciences department was created, the scope of the advisory board was expanded to include all programs within the CIS department. The advisory board met regularly until 2002 when the CIS department moved in to the College of Business. The College of Business has an active advisory board and the need for a separate department advisory board is being evaluated.

The advisory board was instrumental in the curriculum for the MSITM program and participated in discussions related to the Computer Security minor and the Criminal Justice and Computer Security major.

Long Range Plans

Challenges

- Develop and maintain up-to-date computing facilities for student and faculty use.
- Maintaining a well-rounded and effective curriculum for students without losing stability and consistency.
- Continued placement of graduates who can be leaders in the information technology field.
- Finding well qualified faculty as the department continues its growth.
- Coordination of the five departmental offerings and faculty to present a unified department.
- Competition from Western Illinois University and other universities particularly related to distance learning.
- Improve marketing of computer related programs within area High Schools.

Strengths

- Well-qualified faculty with varied backgrounds and areas of expertise.
- Smaller class size.
- Well-equipped computer labs with appropriate software.
- Academic alliances with Microsoft (MSDNAA) and IBM (scholars program).
- Ability and willingness to introduce new courses as demanded by technological trends.
- Good reputation with local industry.

Opportunities

- Continued high demand for computer professionals.
- Continued good working relationship with local business and industry.
- Solid internship program.
- Advances in technology will lead to the need for new course content.
- Advances in technology will lead to new course presentation methodologies.
- Demand is increasing for graduates with advanced degrees and so an opportunity exists for continued growth of the MSITM program.

Five-year vision and objectives

- Continued upgrade of current lab facilities.

- Develop articulation agreements with regional two-year colleges to enhance transfer options for undergraduate students.
- Provide a concentration in Information Assurance for MBA students.
- Provide 1-2 areas of specialization within the MSITM program.
- Develop proper research lab facilities (upgrade current lab in regards to physical size of lab and quantity/quality of equipment).
- Reach and maintain enrollment of at least 30-40 students in MSITM program.
- Develop an academic-industry joint development and research program and build upon current relationship with business and industry.
- Build the base of undergraduate students in our four programs, maintaining at least 35-45 students in each program
- Evaluate the feasibility of offering the MSITM program at satellite sites with the MBA.
- Develop alternate program presentation methods. (online and/or distance)

Ten-Year Vision

- Be established as a leader for computer education with strong ties to local business and industry and be the premier provider of computer related education within our region.
- Higher ACT/SAT scores for incoming freshmen.
- Provide 1-2 areas of specialization within the MSITM program.
- Develop and maintain a high level of usage of interactive instructional technologies and alternate program presentation methods.
- Support 8-10 full-time faculty.

Assessment of the Department and its programs

Mission Statement

The mission of St. Ambrose University is to enable all of its students to develop intellectually, spiritually, ethically, socially, artistically, and physically in order to enrich their own lives and the lives of others. The Department of Computer and Information Sciences has the additional mission of providing its majors with the opportunity to develop a deep understanding of the core concepts in traditional computer science, information systems, or computer networks and to prepare them for graduate school or for progressive careers in the computer field.

Objectives for Teaching and Learning

Upon completion of major requirements, Computer and Information Sciences students will be able to:

1. Define information technology concepts and apply them in professional practice.
2. Respond to problems with critical analysis and creative solutions.

3. Research technological concepts, issues, and methodologies, and express them both orally and in writing.
4. Utilize computer tools in the analysis, design, testing, and implementation of information systems.
5. Exercise ethical and professional judgment in the use of computer technology.

Assessment Plans

The primary assessment components are common to all four of the undergraduate major programs and the MSITM program. The common elements of the departmental assessment plan are presented first, followed by the specific items of the assessment plan for each of the departmental major programs (as revised in the last program review), and finally a summary of assessment results. The final section will be a review and evaluation of the assessment process.

Each of the five major program sections will include specific goals and objectives for that major and a grid showing where in the major each goal and objective is met.

Common Departmental Assessment Features

Information technology is a rapidly changing field. The changes in technology and methodology are continual. As a result, the program and its curriculum need to be studied on a continual basis. This is accomplished through four methods.

1. Input from advisory group meetings and review of current trends in the information technology industry.
2. Review of professional association curriculum recommendations, i.e. Association of Computing Machinery (ACM), Institute of Electrical and Electronics Engineers (IEEE), and The Association of Information Technology Professionals (AITP). The review will be carried out at least twice during the five-year review cycle by the faculty who teach the primary courses related to each of our programs.
3. Evaluations of interns and reports from their sponsoring organizations. This evaluation will be an ongoing process as internships are completed. A more formal review will be carried out by a subcommittee of CIS department faculty in the year prior to the five-year review.
4. Post graduation survey of graduates done during the year immediately before each program review.
5. Writing samples will be collected from appropriate classes and reviewed once during each school year by a subcommittee of department faculty appointed by the department chair. The samples will be collected and saved by the instructor of each designated course. The writing samples will come from courses selected to demonstrate both formal writing and informal writing (e.g. program documentation) from freshmen and sophomores, and from juniors and seniors. The designated courses will include 1-2 courses typically taken by lowerclassmen and 1-2 courses typically taken by upperclassmen. In the 2005-2006 school year the courses will be CSCI 270 and CSCI 435.

Assessment of Student Achievement

The assessment of students will be carried out on at least three levels:

1. Classroom achievement
2. Portfolio
3. Post graduation survey
4. (Optional) Internship evaluation for those students who do an internship.

Classroom achievement will be studied using traditional methods of evaluation including, but not limited to, course exam results, course project evaluation, writing samples from class assignments, and evaluation of in-class presentations. This assessment provides feedback to students concerning their own progress and gives the departmental faculty information about the extent to which our mission and objectives are being met.

The portfolio will be maintained by the student's departmental advisor and will include at least transcripts of the student's coursework and samples of the student's work from courses appropriate to the student's major. The student will have the option to review the portfolio and add additional samples at any time.

The post graduation survey will be used to assess the career achievement of graduates as well as how well the graduates feel they are prepared to achieve their own life goals and objectives. The survey will be conducted during the year immediately before each program review.

Internship success will be evaluated by periodic reports from internship sponsor, periodic site visits by the faculty internship coordinator, and periodic reports from the student.

Computer Science Major Assessment Specifics

For **Computer Science** (CS) majors the department's overall objectives imply several specific goals.

All Computer Science majors will:

1. be proficient in at least two programming languages including C++ and Visual Basic.
2. understand the principles of operating systems and be proficient in the use of two modern operating systems.
3. understand the principles of database systems and be proficient with at least one current database software package.
4. understand the general principles of computer networks and be able to demonstrate the use of the Internet for communications and research.
5. understand the organization and architecture of computer systems.
6. understand the techniques of elementary calculus and be able to use those techniques to solve appropriate problems.
7. be able to demonstrate the use of a mathematical package in performing standard mathematical calculations and demonstrations.
8. be able to write effectively about both computer science and mathematics.

Number	Class Title	1	2	3	4	5	6	7	8
CSCI 120	Introduction to Computer Science		x	x	x	x		x	
CSCI 195	C++ Programming I	x	x			x			
CSCI 240	Assembler Language Programming	x	x			x			
CSCI 310	Data Structures	x		x					
CSCI 320	Computer Organization	x	x			x			
CSCI 360	Database Management Systems	x		x	x				
CSCI 370	Networks and Data Communications				x				x
CSCI 385	Programming in Java	x	x						
CSCI 395	C++ Programming II	x	x			x			
CSCI 400	Programming Language Concepts	x	x			x			x
CSCI 410	Operating Systems		x		x				x
CSCI 420	TCP/IP and Internet Management								
CSCI 430	Artificial Intelligence	x							
CSCI 440	Multimedia Development								
CSCI 450	Network Operating System Topics		x			x			
CSCI 470	Advanced Computer Networks and Data Communication				x				x
CSCI 480	Topics in Computer Science								
CSCI 499	Internship in Computer Science								x
MATH 191	Calculus and Analytic Geometry I						x	x	
MATH 192	Calculus and Analytic Geometry II						x	x	
MATH 290	Linear Algebra							x	
MATH 300	Probability and Statistics I							x	

Computer Information Systems Major Assessment Specifics

For **Computer Information Systems** (CIS) majors the department's overall objectives imply several specific goals:

1. All majors will be proficient in at least two programming languages including C++ and COBOL.
2. All majors will understand the principles of operating systems and be proficient in the use of two modern operating systems.
3. All majors will understand the principles of database systems and be proficient with at least one current database software package.
4. All majors will understand the general principles of computer networks and be able to demonstrate the use of the Internet for communications and research.
5. All majors will understand the basic principles of systems design and analysis and be able to apply those principles to the solution of everyday problems.
6. All majors will be able to use a variety of current business related software packages.
7. All majors will understand the basic principles of probability and statistics and be able to use a current software package to perform basic statistical calculations.
8. All majors will understand the fundamentals of accounting and economics and be able to use at least one current software package to solve accounting problems.
9. All majors will be able to write effectively about both business and computer science.

Number	Class Title	1	2	3	4	5	6	7	8	9
CSCI 195	C++ Programming I	X				X				
CSCI 205	Advanced Microcomputer Applications in Business			X	X					
CSCI 210	Computer Systems		X		X					
CSCI 220	Programming With COBOL	X				X				X
CSCI 275	Visual Basic	X		X		X				X
CSCI 300	Systems Analysis and Design			X		X				X
CSCI 360	Database Management Systems	X		X		X				X
CSCI 370	Networks and Data Communications				X					X
CSCI 390	Advanced COBOL Programming	X		X		X				X
CSCI 395	C++ Programming II	X				X				
CSCI 440	Multimedia Development									
CSCI 450	Network Operating System Topics		X		X					
CSCI 460	Advanced Database Management Systems			X		X				X
CSCI 470	Advanced Computer Networks and Data Communication				X					X
CSCI 480	Topics in Computer Science	X								
CSCI 499	Internship in Computer Science									
STBE 337	Statistics for Business and Economics							X		

Computer Network Administration Major Assessment Specifics

For **Computer Network Administration** (CNA) majors the department's overall objectives imply several specific goals:

1. All majors will be proficient with the basic management tasks of at least one network operating system.
2. All majors will understand the principles of computer networks, and be able to use the Internet for communication and research.
3. All majors will be able to use a variety of current business-related software packages.
4. All majors will be able to communicate effectively about current topics in the computer network field using a variety of communication media and methodologies including written, interpersonal, group communications, electronic mail, and electronic conferencing.

Number	Class Title	1	2	3	4
CSCI 210	Computer Systems			X	
CSCI 370	Networks and Data Communications		X		
CSCI 420	TCP/IP and Internet Management	X	X		
CSCI 470	Advanced Computer Networks and Data Communication		X		
CSCI 450	Network Operating System Topics	X			
COMM 203	Interpersonal Communication				X
COMM 306	Group Decision Making				X
COMM 326	Communications and Technology				X
ENGL 315	Written Business Communication				X
ENGL 218	Technical Writing				X
MGMT 310	Principles of Management				X

Computer Investigations and Criminal Justice Major Assessment Specifics

For Computer Investigations and Criminal Justice (CICJ) majors the department's overall objectives imply several specific goals. All majors will:

1. Understand the computing infrastructure of contemporary organizations
2. Identify the sources of cyber crime
3. Organize and develop computer investigative policies and procedures
4. Demonstrate the ability to conduct analytical examination of computer/network systems
5. Understand the potential damaging results of cyber crime
6. Develop computer/network security policies and procedures
7. Recognize the relationship between the Criminal Justice system and investigative procedures
8. All majors will be able to write effectively about both business and computer science.

Number	Class Title	1	2	3	4	5	6	7	8
CSCI 185	Script Programming			X					
CSCI 210	Computer Systems	X	X	X	X	X		X	
CSCI 270	Networks and Data Communications	X	X	X			X		
CSCI 375	Network Forensics		X	X	X	X	X	X	
CSCI 415	Computer Network Security		X	X	X	X	X	X	
CSCI 420	TCP/IP and Internet Management	X	X	X			X		
CSCI 425	Computer Forensics		X	X	X	X	X	X	
CSCI 435	Legal and Ethical Issues in Computing		X			X			X
CSCI 450	Network Operating Systems Topics	X	X	X	X			X	
CSCI 480	Topics in Computer Science (Security Related)								
CSCI 490	Independent Study (Security Related)								
CSCI 499	Internship (Security Related)								
Criminal Justice Core	Various		X	X		X		X	X

MS in Information Technology Management Assessment Specifics

Mission Statement

The mission of St. Ambrose University is to enable all of its students to develop intellectually, spiritually, ethically, socially, artistically, and physically in order to enrich their own lives and the lives of others. The Department of Computer and Information Sciences has the additional mission of providing its majors with the opportunity to develop a deep understanding of the core concepts in traditional computer science, information systems, or computer networks. The objective of the MS in Information Technology Management program is to develop Information Technology (IT) managers competent in the justification, analysis, design, implementation, and management of information technology solutions and to be able to apply them to a diverse set of enterprise challenges. And in addition, to develop managers who are cognizant of the human resource, financial, strategic, and technical issues surrounding the IT function in today's enterprise.

Graduates of the MS in Information Technology Management should:

1. Exhibit knowledge of the skills required of database design, systems analysis, network implementation, and software development,
2. Demonstrate competence in the management of human resources and projects,
3. Be able to identify appropriate technologies and methodologies for adoption by the enterprise,
4. Be sensitive to financial, strategic and ethical issues relating to the IT function and its technologies.

Number	Class Title	1	2	3	4
CSCI 560	Advanced Database Management Systems	X			X
CSCI 570	Advanced Computer Networks and Data Communication	X		X	
CSCI 600	Systems Analysis in the Enterprise	X	X		
CSCI 640	Legal and Ethical Issues in Computing				X
CSCI 650	Project Management and Control		X		
CSCI 515	Computer and Network Security			X	X
CSCI 610	Advanced Programming Languages	X			
CSCI 660	Computer and Commerce			X	
CSCI 700	Software Engineering	X	X		
CSCI 750	Enterprise Resource Management		X		X
CSCI 780	Special Topics in IT				

Results of CIS Departmental Assessment

1. The advisory group met twice yearly during a portion of the five-year review cycle, and was presented with proposed changes or modifications to the department and its programs. The College of Business advisory board continues to meet regularly. As a result of these meetings, some of the changes presented have been evaluated and discussed by these groups and are presented to Educational Policies with advisory board support.
2. While the curricular recommendations from the national groups are sometimes slow to change, they have been reviewed and discussed by the department. The CIS departmental major programs do vary some from the professional association recommendations, but the variations are a result of our target market and anticipation of current trends and future needs.

Some CIS department programs follow the recommendations more closely than others. In particular, the Computer Science major is undergoing significant changes to comply more closely with IEEE and ACM curriculum recommendations. As part of this change process, the faculty who have primary responsibility for the CS related courses have produced a very specific and detailed outline of course content and objectives. This document is attached as Appendix A.

The Computer Investigations and Criminal Justice major closely follows a curriculum recommendation from the Electronic Crime Prevention Initiative (ECPI).

Most organizations have recognized the need for formal presentation and discussion of legal and ethical issues in the IT field. The CIS department has had a specific course dealing with this for three years. With approval of our proposed changes, this course (CSCI 435) will be required in all major programs offered through the CIS department.

Current trends in IT education suggest the use of goal-based projects for the development of problem solving skills in students. The CIS department has employed goal-based projects as part of the CNA curriculum for over six years.

3. The reports and evaluations from internships have been collected by the internship advisor, usually the Department Chair, and kept with the student's advising folder. The information from the reports has reaffirmed the need for an increase in communication skills directly related to IT practice, but also suggest that most of our students are well prepared to work in the IT field.

The CIS department will continue to provide group exercises and classroom presentation opportunities for department majors.

4. A department-wide post graduation survey was not performed. The CIS department has not had the resources to undertake a department-wide post graduation survey. However, an initial targeted post graduation survey was done for the CNA program as part of NSF grant reporting and as a pilot for a departmental survey.

The results of the survey suggest that the graduates believe they are being well-prepared for careers in networking, but the number of respondents was small and so it is not possible to draw specific conclusions.

It is believed that this pilot survey and recent hires in the faculty will allow the CIS department to undertake a department-wide post graduation survey during the upcoming review cycle.

5. Writing samples were collected from CSCI 300, CSCI 360, CSCI 370, CSCI 470, and CNA 400. A representative sample of these papers was evaluated by a subcommittee of the CIS department. As a result of the evaluation, the following steps are being implemented in the CIS department.
 - a. The APA style will be expected for all formal writings in the CIS department.
 - b. Common formats will be developed for documentation and pseudo-code for use in all programming language courses.
 - c. A set of clear objectives will be developed to address writing developmental issues identified in the writing review.
 - d. Writing modules will be incorporated into specific courses to meet the objectives identified above. The courses have not yet been identified.
 - e. Change the writing intensive course structure within the CIS department by seeking WI status for CSCI 435 Legal and Ethical Issues in Computing. After a sufficient time for students to meet their WI requirements, WI status will be dropped from all other CIS department courses.

Proposed Changes to Assessment Components

As a result of the assessment process major program changes have been proposed for the CS, CIS, and CNA major programs. Those changes have been described elsewhere. What follows is updated objectives and an updated course/objective grid for each of the CS, CIS, and CNA programs.

Proposed Computer Science Learning Objectives

For **computer science** (CS) majors the department's overall objectives imply the following specific learning objectives:

1. Discrete Structures

All majors will demonstrate proficiency in the mathematical concepts of discrete structures, including

- a. Functions, relations, and sets
- b. Basic logic
- c. Proof techniques
- d. Basics of counting
- e. Graphs and trees
- f. Discrete probability

2. Programming Fundamentals

All majors will display the programming skills indicated below, independent of the specific programming language used.

- a. Fundamental programming constructs
- b. Algorithms and problem solving
- c. Fundamental data structures
- d. Recursion
- e. Event-driven Programming

3. Algorithms and Complexity

All majors will identify the range of algorithms that address an important set of well-defined problems, recognize the strengths and weaknesses of each algorithm, and determine the suitability of each algorithm in a particular context. In particular, each major will have a command of

- a. Basic algorithmic analysis
- b. Algorithmic strategies
- c. Fundamental computing algorithms
- d. Distributed algorithms
- e. Basic computability
- f. Complexity classes P and NP

4. Architecture and Organization

All majors will exhibit mastery the following functional components of a computer system, along with their characteristics, performance, and interactions:

- a. Digital logic and digital systems
- b. Machine level representation of data
- c. Assembly level machine organization
- d. Memory system organization and architecture
- e. Interfacing and communication
- f. Functional organization
- g. Multiprocessing architectures
- h. Performance enhancements
- i. Architecture for networks and distributed systems

5. Operating Systems

All majors will exhibit a mastery of the essential aspects of computer operating systems, which includes

- a. Overview of operating systems
- b. Operating system principles
- c. Concurrency
- d. Scheduling and dispatching
- e. Memory management
- f. Device management
- g. Security and protection
- h. File systems
- i. Real-time and embedded systems

6. Net-Centric Computing

All majors will grasp the general principles of computer networks, including

- a. Net-Centric Computing
- b. Communication and networking
- c. Network security
- d. Network Management
- e. Wireless and mobile computing

7. Programming Languages

All majors will communicate an understanding the following theoretical underpinnings of programming languages and how different languages reflect different programming paradigms:

- a. Overview of programming languages
- b. Virtual machines
- c. Language translation
- d. Declarations and types
- e. Abstraction mechanisms
- f. Object-oriented programming
- g. Functional programming
- h. Type systems
- i. Programming language semantics

8. Human-Computer Interaction

All majors will exhibit an understanding of the issues that affect the interface between humans and computers, including

- a. Foundations of human-computer interaction
- b. Graphical user interfaces

9. Intelligent Systems

All majors will identify the types of problems that are best solved with artificial intelligence and display their knowledge of how to implement such solutions.

Specifically, they will grasp

- a. Fundamental issues in intelligent systems
- b. Search and constraint satisfaction
- c. Knowledge representation and reasoning
- d. Advanced search
- e. Advanced knowledge representation and reasoning
- f. Machine Learning
- g. Natural Language Processing
- h. Perception
- i. Robotics

10. Information Management

All majors will be able to develop the following conceptual and physical data models, determine what information management methods and techniques are appropriate for a given problem, and be able to select and implement the appropriate information management solution

- a. Information models and systems
- b. Database systems
- c. Data modeling
- d. Relational databases
- e. Database query languages
- f. Relational database design
- g. Transaction Processing

11. Social and Professional Issues

All majors will describe the social and professional issues that have been magnified with the advent of computer systems. These issues include:

- a. History of computing
- b. Social context of computing
- c. Methods and tools of analysis
- d. Professional and ethical responsibilities
- e. Risks and liabilities of computer-based systems
- f. Intellectual property
- g. Privacy and civil liberties
- h. Computer crime
- i. Economic issues in computing
- j. Philosophical frameworks

12. Software Engineering

All majors will demonstrate mastery of the methods used to design and specify software, including:

- Software design
- Using APIs
- Software tools and environments
- Software processes
- Software requirements and specification
- Software validation
- Software evolution
- Software project management

13. Mathematical Reasoning

All majors will integrate formal mathematical reasoning and techniques to solve and understand advanced computer science concepts.

Objective		CSCI 180 Discrete Structures	CSCI 195 Object-Oriented Programming I	CSCI 270 Networks and Data Communications	CSCI 295 Object-Oriented Programming II	CSCI 310 Data Structures	CSCI 320 Computer Architecture	CSCI 360 Database Management Systems	CSCI 393 Algorithm Design and Analysis	CSCI 400 Programming Language Concepts	CSCI 410 Operating Systems	CSCI 435 Legal and Ethical Issues in Computing	MATH 191 Calculus and Analytic Geometry I	CSCI 430 Artificial Intelligence	CSCI 480 Special Topics	CSCI 490 Senior Project	CSCI 420 TCP/IP and Internet Management	CSCI 450 Network Operating Systems	CSCI 470 Advanced Computer Networks	MATH 290 Linear Algebra	MATH 300 Probability and Statistics
1a	Functions, relations, and sets	x							x	x			x							x	
1b	Basic logic	x	x											x							
1c	Proof techniques	x							x	x	x		x	x						x	x
1d	Basics of counting	x																			
1e	Graphs and trees	x				x			x					x						x	
1f	Discrete probability	x												x							x
2a	Fundamental programming constructs		x		x	x				x						x					
2b	Algorithms and problem-solving		x		x	x			x		x			x		x					x
2c	Fundamental data structures		x		x	x		x	x							x					
2d	Recursion				x	x			x	x	x			x							
2e	Event-driven programming				x											x					
3a	Basic algorithmic analysis				x	x			x							x				x	
3b	Algorithmic strategies					x			x					x		x					x
3c	Fundamental computing algorithms		x		x	x			x							x					
3d	Distributed algorithms										x					x					

Proposed Computer Information Systems Major Assessment Specifics

For **computer information systems** (CIS) majors the department's overall objectives imply that all majors will:

1. Be proficient in at least two programming languages
2. Understand the principles of operating systems
3. Be able to identify the characteristics of two modern operating systems.
4. Understand the principles of database design and the functions of Database Management Systems
5. Understand the general principles of computer networks
6. Understand the basic principles of systems design and analysis and be able to apply those principles to the solution of business problems
7. Develop an awareness of the legal and ethical issues in computing
8. Understand the basic principles of probability and statistics and be able to use a current software package to perform basic statistical calculations.
9. Understand the fundamental business principles and systems
10. Be able to write effectively about both business and computer science.

No.	Class Title	1	2	3	4	5	6	7	8	9	10
CSCI 195	Object Oriented Programming I	X					X				X
CSCI 210	Computer Systems		X	X	X	X		X			X
CSCI 270	Networks and Data Communications					X		X			X
CSCI 275	Visual Basic	X			X		X				X
CSCI 295	Object Oriented Programming II	X			X		X				X
CSCI 300	Systems Analysis and Design				X	X	X	X			X
CSCI 360	Database Management Systems	X			X		X				X
CSCI 390	Application Programming with COBOL	X			X		X				X
CSCI 295	Object Oriented Programming II	X			X		X				X
CSCI 435	Legal and Ethical Issues in Computing							X			X
CSCI 450	Network Operating System Topics		X	X		X					
CSCI 460	Advanced Database Management Systems				X		X				X
CSCI 470	Advanced Computer Networks and Data Communication					X		X			X
CSCI 480	Topics in Computer Science										
CSCI 499	Internship in Computer Science									X	
STBE 333	Operations Management								X	X	
STBE 337	Statistics for Business and Economics								X		
ENGL/COMM Elective	Various										X
BUSINESS Core	Various									X	X

Proposed Computer Network Administration Major Assessment Specifics

For **Computer Network Administration** (CNA) majors the department's overall objectives imply several specific goals:

1. All majors will be proficient with the basic management tasks of at least one network operating system.
2. All majors will understand the principles of computer networks, and be able to use the Internet for communication and research.
3. All majors will be able to automate common administrative tasks using a scripting language.
4. Understand the fundamentals of computer systems.
5. Develop an awareness of the legal and ethical issues in computing.
6. All majors will be able to communicate effectively about current topics in the computer network field using a variety of communication media and methodologies including written, interpersonal, group communications, electronic mail, and electronic conferencing.

Number	Class Title	1	2	3	4	5	6
CSCI 185	Script Programming			X			
CSCI 210	Computer Systems				X		
CSCI 270	Networks and Data Communications		X				
CSCI 420	TCP/IP and Internet Management	X	X				
CSCI 435	Legal and Ethical Issues in Computing					X	
CSCI 470	Advanced Computer Networks and Data Communication		X				
CSCI 450	Network Operating System Topics	X					
COMM 326	Communications and Technology						X
Various Communication							X
MGMT 310	Principles of Management						X

Evaluation of CIS Department Assessment Plan

The implementation and effectiveness of the assessment plan will be addressed by the department annually and minor modifications proposed as needed at that time. The overall plan will be subject to a zero-based analysis during each program review.

Results of Assessment Plan Evaluation

Since the last review in 2000, the CIS department has clarified some responsibilities and timing of individual components of the assessment plan, and the departmental objectives were rewritten to better reflect our current department.

As a result of our zero-based evaluation of the department's assessment plan, we are not recommending any significant changes in the department assessment plan. The following are suggested to strengthen both the assessment plan and its implementation.

1. The CIS department needs to commit the necessary resources to a department-wide post graduation survey.
2. Review and rewrite individual program objectives to present a common style, format, and structure.
3. Develop a procedure that allows the CIS department to engage its students in the assessment process in both student achievement and program assessment.
4. Formalize the collection and presentation of data related to student achievement.